WHAT IS CLAIMED IS:

1. A simulation method for circuit characteristic of semiconductor device, comprising:

obtaining a first characteristic value fluctuating most of a characteristic of an element composing the semiconductor device according to a fluctuation of a parameter of the element;

determining a width of the fluctuation of the parameter matching a second characteristic value of the worst case of the characteristic of the element with the first characteristic value; and

determining a third characteristic value of the worst case of the circuit characteristic of the semiconductor device based on the width of the fluctuation.

2. The simulation method as in claim 1, wherein said obtaining the first characteristic value comprises:

inputting a frequency distribution of the fluctuation of the parameter; and

obtaining the first characteristic value using the fluctuation according to Monte Carlo analysis.

3. The simulation method as in claim 2, wherein said determining the width of the fluctuation of the parameter comprises obtaining a standard deviation σ by approximating the frequency distribution to Gaussian distribution; and standardizing the width of the fluctuation with the σ, and said determining the third characteristic value comprises determining the third characteristic value according to the width of the standardized fluctuation.

4. The simulation method as in claim 1, wherein the fluctuation width of the parameter is determined under a condition in which the value of the function F defined by:

$$F = [(x - x0)^2 + (y - y0)^2]^{1/2}$$

is a minimum value, where (x, y) and (x0, y0) are characteristic values of the element having the second characteristic value and the first characteristic value.

5. The simulation method as in claim 1, wherein the element is a field effect transistor (FET), the parameter is at least one of gate length and gate oxide film thickness.

6. The simulation method as in claim 5, wherein the parameter is at least one of channel impurity concentration and diffusion layer resistance.

7. The simulation method as in claim 1, wherein the element is a field effect transistor, the characteristic of the element is at least one of drive current and threshold voltage.

8. The simulation method as in claim 1, wherein the circuit characteristic is at least one of access time, propagation delay time, frequency and power consumption.

9. A simulator for the circuit characteristic of semiconductor device comprising:

an input/output unit to input a frequency distribution of a fluctuation of a parameter of an element composing the semiconductor device;

a Monte Carlo analyzing unit to obtain the first characteristic value fluctuating most of the characteristics of the element due to the fluctuation;

a first worst case analyzing unit to obtain a second characteristic value of the worst case of the characteristic as a function of the fluctuation width of the parameter;

a computing unit to determine the fluctuation width which matches the second characteristic value with the first characteristic value; and

a second worst case analyzing unit to determine a third characteristic value of the worst case of the circuit characteristic of the semiconductor device based on the fluctuation width.

10. The simulator as in claim 1, further comprising:

a circuit characteristic determining unit to determine whether or not the third characteristic value satisfies a specification of the circuit characteristic;

a parameter selecting unit to select the parameter which is a cause for not satisfying the circuit characteristic; and

a setting unit to set a nominal value of the selected parameter or a fluctuation width.

11. A manufacturing method of semiconductor device comprising:

obtaining a first characteristic value fluctuating most of a characteristic of an element composing the semiconductor device according to a fluctuation of a parameter of the element;

determining a width of the fluctuation of the parameter matching a second characteristic value of the worst case of the characteristic of the element with the first characteristic value;

determining a third characteristic value of the worst case of the circuit characteristic of the semiconductor device based on the width of the fluctuation;

determining whether or not the third characteristic value satisfies a specification of the circuit characteristic;

selecting the parameter which is a cause for not satisfying the circuit characteristic;

setting a specification of the selected parameter; and

manufacturing the semiconductor device according to the set specification of the parameter.

12. The manufacturing method as in claim 11, wherein said obtaining the first characteristic value comprises:

inputting a frequency distribution of the fluctuation of the parameter; and

obtaining the first characteristic value by the fluctuation according to Monte Carlo analysis.

13. The manufacturing method as in claim 12, wherein said determining the width of the fluctuation of the parameter comprises obtaining a standard deviation σ by approximating

the frequency distribution to Gaussian distribution; and standardizing the width of the fluctuation with the σ, and said determining the third characteristic value comprises determining the third characteristic value according to the width of the standardized fluctuation.

14. The manufacturing method as in claim 11, wherein the fluctuation width of the parameter is determined under a condition in which the value of the function F defined by:

$$F = [(x - x0)^2 + (y - y0)^2]^{1/2}$$

is a minimum value, where (x, y) and (x0, y0) are characteristic values of the element having the second characteristic value and the first characteristic value.

15. The manufacturing method as in claim 11, wherein the element is a field effect transistor, the parameter is at least one of gate length and gate oxide film thickness.

16. The manufacturing method as in claim 15, wherein the parameter is at least one of channel impurity concentration and diffusion layer resistance.

17. The manufacturing method as in claim 11, wherein the element is a field effect transistor, the characteristic of the element is at least one of drive current and threshold voltage.

18. The manufacturing method as in claim 11, wherein the circuit characteristic is at least one of access time, propagation delay time, frequency and power consumption.